

[PROC. ROY. SOC. VICTORIA, 48 (N.S.), PT. II., 1935.]

ART. VIII.—*On the Occurrence of Bacillus Carotovorus Jones causing a Soft Rot of Iris in Victoria.*

By B. J. GRIEVE.

[Read 10th October, 1935; issued separately, 1st June, 1936.]

In 1933, Iris plants showing a bacterial soft rot of the rhizome were brought to the Botany School by a private grower. As the plants had been imported from Germany, it was suspected that the disease had been latent in them, and that was the first appearance of the disease in Victoria. In 1934, however, *Iris germanica* plants in the University grounds were found to be badly infected with the same disease. The soft rot of Iris has since been observed in private gardens around Melbourne. An examination of the literature and of Brittlebank's Catalogue of the Australian Fungi and Bacteria (unpublished), showed that there was no Victorian record of a bacterial soft rot of Iris.

### Symptoms.

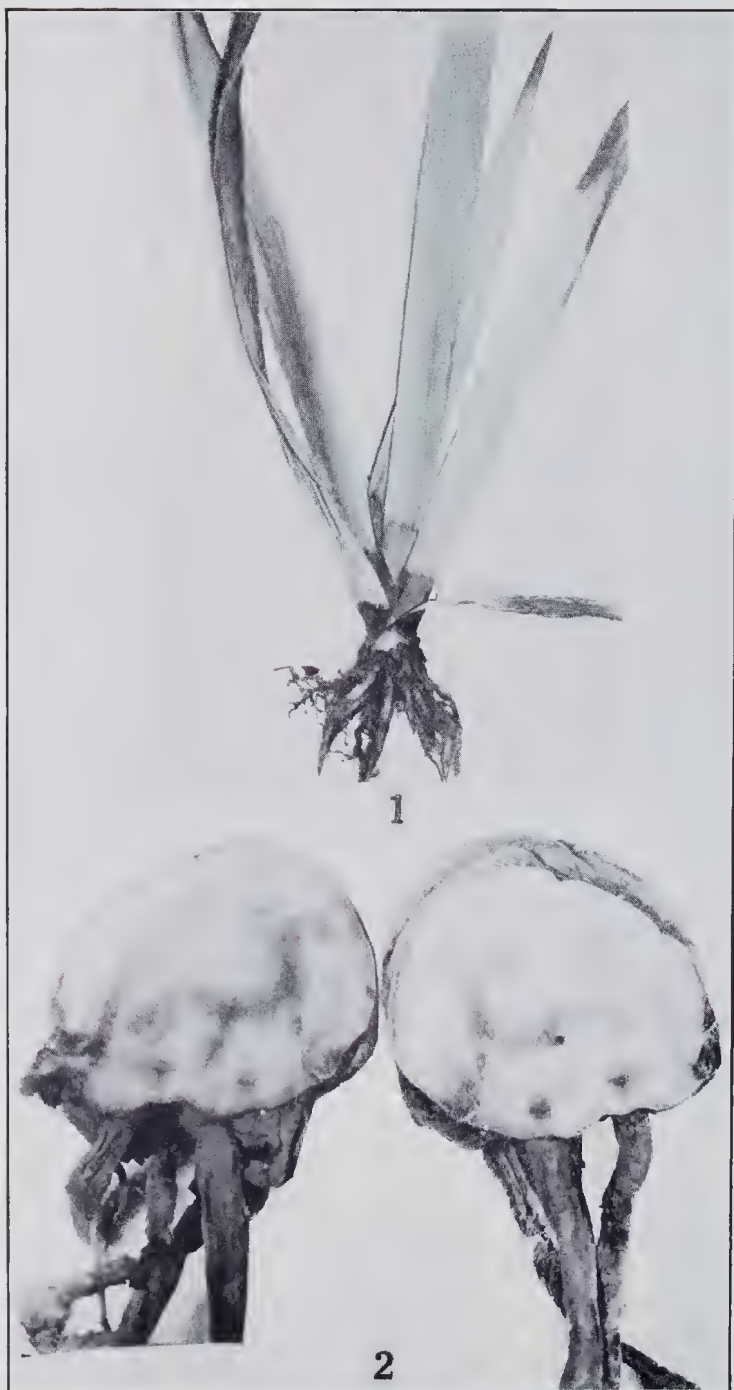
The first noticeable symptom is a browning and dying of the tips of the leaves. Examination of the basal parts of such leaves shows a water soaked region, extending upwards from the rhizome. The rhizome, on being cut transversely, is seen to have a cheesy consistency, and a cream coloured bacterial ooze comes from the cut surfaces. Often, a dark line across the cut surface of a rhizome shows the junction of diseased and healthy tissue. In transverse sections through leaf bases, large numbers of bacteria may be seen filling the wood vessels. These bacteria are also to be seen in the intercellular spaces.

### Isolation of the Organism and an Account of its Cultural and Physiological Characters.

The same bacterial organism was consistently isolated from infected leaf bases. The disease was reproduced in *Iris germanica* and the organism reisolated. Inoculation of carrot halves with the organism also produced a soft rot of the parenchyma tissue.

The organism was found to be a short rod ( $.6\mu \times 1.5\mu$ ), which occurred frequently in pairs or chains. The gram reaction was negative, and neither spores nor capsules were observed. Active motility was shown by the organisms in broth and sterile water, and they were demonstrated to possess peritrichous flagella. On beef agar plates, the colonies grow quickly, and may reach as much as one centimetre in diameter. They are white in colour, smooth surfaced and glistening, and the edges become rather undulate or even fimbriate. Nutrient broth is uniformly clouded





Soft Rot of Iris.

in 24 hours, and, after some days, there is a suggestion of pellicle formation. Growth in Fermi's solution and in Uschinsky's solution is abundant, both types of media showing dense uniform clouding in 48 hours. No pellicle forms in either case. Gelatine is not liquefied. Acid and gas are produced in glucose, lactose, saccharose, and galactose. Nitrates are reduced, but there is no indol production. The diastatic action is weak. Litmus milk becomes acid within a few days but no clot occurs.

### Discussion.

The above characters place the organism closest to *Bacillus carotovorus* Jones (1). The differences recorded are as follows:—(a) non-liquefaction of gelatine, (b) failure to produce indol, (c) absence of any definite diastatic reaction.

Only the last of these characters has not previously been recorded as a divergence from the type. Liquefaction of gelatine is not constant for the species, and Stapp (2) in 1928 working with a culture of *B. carotovorus*, concluded that no indol was produced. The organism isolated is therefore considered to be *Bacillus carotovorus* Jones.

### Bibliography.

1. JONES, L. R., 1901.—A soft rot of carrot and other vegetables caused by *Bacillus carotovorus* Jones. *Vermont Agr. Expt. Sta. Report*, xiii.: pp. 299-332.
2. STAPP, C., 1928.—Die Schwarzbeinigkeit und Knollennassfäule der Kartoffel. *Arb. aus der Biol. Reichsanstalt für Land. und Forst.*, xvi.: pp. 643-703.

### Explanation of Plate.

Fig. 1.—*Iris germanica* plant showing the browning at the tips of the water soaked soft rot area at the base.

Fig. 2.—Rhizome of *Iris* cut transversely to show the brownish black band delimiting the lower diseased part from the upper healthy part.